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ABSTRACT

This investigation of the effect of computer-assisted instruction (CAI) on the learning of library skills hypothesized that there would be a substantial difference in the achievement of library skills by those students who received additional drill and practice through the use of CAI and those who received additional drill and practice only from worksheets. Twenty-four students from a third grade class in an urban school were randomly assigned to either the experimental or control group. Results measured by a posttest revealed no significant difference in achievement between the two groups. An extensive review of related research on CAI is included, and 34 references are listed. The pre- and posttests, worksheets, and the raw score data are appended. (MES)

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DOES COMPUTER ASSISTED INSTRUCTION EFFECT THE ACHIEVEMENT OF THIRD GRADERS IN LIBRARY SKILLS?

by

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Submitted in Partial Fulfillment of the Requirements
of the Master of Arts Degree in Reading Specialization

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ABSTRACT

This study involved twenty-four third grade students from an urban school. It was hypothesized that there would be a substantial difference in the learning of library skills with those students who received additional drill and practice through the use of computer assisted instruction than those students who received additional reinforcement from worksheets. Dictionary skills, the card catalog and the index were the library skills covered over a six week period.

An analysis of the results indicated that there was no significant difference in achievement between the two samples and the actual student achievement appeared to be almost identical.

ACKNOWLEDGEMENTS

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DOES COMPUTER ASSISTED INSTRUCTION

EFFECT THE ACHIEVEMENT OF

THIRD GRADERS IN LIBRARY SKILLS?

Microcomputers have become the fastest growing trend in education today. It has become apparent to educators that the computer can be a very important tool in the instruction of students. David Moursund (1980) states that since computers have become mass produced, they are now a cost-effective aid to instruction in a variety of situations.

Computer assisted instruction (CAI) is one method of instruction that has grown out of computer use in education. Computer assisted instruction is the use of computers to present instruction to students. It is the interaction between the computer and the student, to help the student acquire new concepts or to improve knowledge of previous learned concepts.

The most common instructional use of computer assisted instruction is for drill and practice. The computer plays an important role in reinforcing what has been taught by presenting drills. According to Moursund (1981) the use of drill and practice is an educationally effective aid to learning as well as for helping students to learn more concepts, better and faster.

Another important aspect of computer assisted instruction is it's ability to provide for individual differences. Because of the varied abilities and rates of

comprehension of students, this type of instruction can let the student proceed as slowly or as quickly as possible. The computer can present just enough material to the student that will be necessary for him or her to master the skill. Suppes (1985) suggests that computer assisted instruction allows students to progress in each skill on the basis of their ability in that skill. According to CRC Education (1981), the computer provides for effective sequencing of material. The computer moves the student to the next level of difficulty as soon as he/she has correctly answered a predetermined number of questions.

Learning in privacy is another aspect of computer assisted instruction. The computer provides immediate feedback. Students do not have to wait for the teacher to correct their work. If errors are made, the student receives an immediate response and can rethink and change the answer into a correct one. Students can make errors and the computer handles them without embarrassing or putting unnecessary pressure on the learner.

Computer assisted instruction provides for time of task as suggested by Becker (1984). Student time is likely to be more on task than traditional seatwork activities. The computer can also speed up the progress of student's work. Kepner (1982) states that students who engage in

computerized practice are able to complete up to three times as many exercises as they would have completed in other practice modes.

The computer and this type of instruction could be nicknamed the "tireless teacher" according to CRC Education (1981). The computer keeps track of right and wrong answers, provides feedback and speeds along instruction based on performance. It also has infinite patience and will continue to instruct on the appropriate levels as long as the student wants to learn.

However Coburn (1982) cautions that there is the need for concern when drill and practice are used in substitution for primary instruction by the teacher. He feels that the computer software programs currently available are not sophisticated enough to instruct students as well as most teachers could. According to Holmes (1982) computer assisted instruction in the hands of a mediocre teacher will probably result in ineffective instruction. The availability of software programs does not automatically ensure that computer assisted instruction will be effective. Hofmeister (1982) also suggest that computer assisted instruction is most effective when it is used to supplement rather that replace initial instruction.

According to Holmes (1982) computer assisted instruction is at least as effective as traditional instruction and may lead to significant improvements in some subject areas.

Suppes and Morningstar (1969) suggest that an additional thirty minutes of ordinary classroom drill and practice can accomplish the same results as fifteen minutes of computer assisted instruction.

A correct answer has a small probability of indicating learning as stated by Kepner (1982). Several correct answers, over a period of time, will increase the probability that learning has occurred. But if an exercise is identical, there is the problem that the learning is rote memorization. Edwards, Norton, Taylor, Weiss and Dusseldorp (1985) suggest that even though students may learn more or may learn more quickly through computer assisted instruction, some evidence suggests that they may not retain as much as traditionally taught students.

But the long term effects of computer assisted instruction are still unclear. Jamison, Suppes, and Wells (1974) report computer assisted instruction as the newest instructional method but also as the most expensive. The amount of money spent on computers and related software is as much as one third the amount spent on books in all

subjects and grades combined according to Becker (1984). A decision must be made by educators on how much computer assisted instruction is really worth. Vinsonhaler and Bass (1972) suggest that the effects obtained through computer assisted instruction might be obtained through less expensive means.

HYPOTHESIS

To provide additional evidence concerning this topic, a study was conducted to determine the effect of computer assisted instruction on the learning of library skills by third grade students. It was hypothesized that a substantial difference in the achievement of library skills would exist for those students who received additional drill and practice through the use of computer assisted instruction rather than to those students who received additional drill and practice only from worksheets.

PROCEDURES

Due to time limitations and the availability of only two computers, students from one third grade class in an urban school, were selected to participate in this study on computer assisted instruction.

Twenty-four students from this classroom were randomly assigned to either the experimental or control sample. Previous academic acheivement was not considered.

Before beginning the study, the students in the experimental sample were given instruction and practice in how to use the computer and how to handle the computer software. This was done so these students would feel comfortable using the computer.

Also at the start of this study, a Pretest, examiner prepared, on the library skills to be covered was administered to both samples. During this time, signs of frustration were visible by both samples.

During a six week period, three major areas of library skills were taught -- dictionary skills, the card catalog and the index. In the dictionary skills, alphabetical order, guide words and dividing the dictionary into three sections were the areas covered. Locating author, title and subject headings in the correct drawers were covered in the card catalog skills. The index skills covered the display of simple indexes and the answering of pertinent questions concerning the information available in the index. A two week time period was spent on each skill and was covered during the library time of this third grade class.

Both samples were given initial instruction by the Librarian. The control sample of twelve students then reviewed the skills taught through prepared worksheets. The

experimental sample of twelve students were broken down into four groups; two groups of three boys each and two groups of three girls each. This sample then reviewed the skills taught by going to the computer and using commerically produced software. Dictionary Skills and Using an Index, two programs produced by Right-On Programs of Central Islip, N.Y. (1984) were used, as well as Library Skills produced by Micro Power and Light Co. of Dallas, Texas (1980).

The Experimental sample spent approximately twenty minutes per week at the computer.

At the end of six weeks, both samples were re-administered the same test they took at the beginning of this study to determine posttest scores. At this time, most of the students seemed to react more favorably and comfortably with this test of library skills on the dictionary, the card catalog, and the index.

RESULTS

Table 1 illustrates the Library Skills Pretest and Posttest results for the control and experimental samples.

Table 1

Raw Score of Library Skills Pretest and Posttest Results

Pretest Results

Samples	Mean	SD	t
Control N=12	100.5	13.01	.77
Experimental N=12	96.5	12.42	

Posttest Results

Control	109.25	9.50	1.13
Experiemental	104.91	9.35	

As indicated by the results, the control sample had a slightly higher mean in the pretest as well as in the posttest. Using the t - test to determine the significance of the difference between two means, the resulting t indicated there was no significant difference either at the outset of the study or at the conclusion. It can be seen that the control sample, using conventional paper and pencil

materials, made a slightly higher mean gain (8.75) than did the sample using CAI (8.41) in this period. While the modest difference was not significant, as previously noted, it can be seen that actual student achievement appears to be almost identical in terms of points gained over the period.

CONCLUSIONS

School districts, across the country, have spent huge amounts of money so students can become computer literate, as well as using computers as another teaching tool. Today computer software is available for drill and practice in all subject areas. However the results of this study indicated that there was no significant difference between those students who used the computer and those who did not, therefore implying that computer assisted instruction does not enhance the learning of library skills.

Despite claims that computer assisted instruction could be rename the "tireless teacher" because of its infinite patience, as well as letting students learn and make mistakes in private, it appeared that these features did not have any effect on the achievement of these third graders in library skills.

Commerically produced software was used in this study. There is the possibility that the reading level of this software was beyond the reading level of the students

this software was beyond the reading level of the students using it. This could have caused problems for the experimental sample. If they could not read the material presented, they could not understand nor respond correctly to skills being reinforced.

It is also possible that the activities covered in the software were presented in a manner different than these students were accustomed to and therefore caused confusion. Also the library skills reinforced in the software could have been inappropriate in comparision to what was taught by the librarian during the study. It would have been more appropriate if the software used was programmed especially for this study, in library skills, rather than using commerically produced software.

Most of the students in the experimental sample used a computer for the first time during this study. Unfortunately, these students do not have computers at home or rarely get the opportunity during the busy school day to work at the computer for even a short time. Maybe these particular students felt more comfortable with the traditional form of "paper and pencil" and the use of something new caused nervousness and effected their achievement.

Since this study was done over a six week period with a group of twenty-four students, the possibility exists that if this study was conducted over a longer period of time with a different sample of students the results might be different and it is suggested that such a study be coordinated.

Computers in education are here to stay and the results of this study should not dictate a negative attitude towards computer assisted instruction, however more extensive research is needed to determine the specific value of computer assisted instruction.

COMPUTER ASSISTED INSTRUCTION : RELATED RESEARCH

Because of the recent popularity of microcomputers in education and the uncertain long term effects of computer assisted instruction, studies have been done, in various subject areas, in order to determine the effectiveness of computer assisted instruction.

One study undertaken by Richard C. Atkinson (1966) used computer assisted instruction to teach reading. The Stanford CAI Project as it was called was a joint project between Stanford University and the IBM corporation.

This study was started in September 1966 with approximately 100 culturally disadvantaged first grade children from the Brentwood School in East Palo Alto, California. Computerized instruction began with half of the first grade students using computer assisted instruction in reading beginning November 1966. The other half of students functioned as the control group and were taught reading by the teacher in the classroom. However this group received mathematics instruction through CAI.

This Stanford CAI Project used one central process computer with tape storage units, disc-storage units, a card reader/punch, a line printer, two procter stations and an interphases to sixteen individual terminals. The student terminals consisted of a picture projector, a cathodoe ray tube (CRT), a light pen with the CRT, a modified typewriter

keyboard and an audio system which played prerecorded messages.

Initially students were given a brief period of time per day on the computer then being increased to twenty minutes after the first six weeks; with the time finally being increased to 30 to 35 minutes in June 1966.

Both the experimental and control groups were tested extensively before the project began in September and again as the school year ended. The two groups remained constant for the length of the study.

Atkinson's findings were that the group who received reading instruction through computer assisted instruction performed significantly better on all the posttests, except for the comprehension subtest on the California Achievement Test.

POSTTEST RESULTS

California Achievement Test	EXP	CON
Vocabulary	45.9	38.10
Comprehension	41.45	40.62
Total	45.63	39.61

It is a common fact that girls generally acquire reading skills more rapidly than boys. In this study, Atkinson found that there was no difference between male and

female students in the rate of progress in acquiring reading skills when using computer assisted instruction.

Another study on the effects of computer assisted instruction in the teaching of reading was done by Fletcher and Suppes (1971).

The data was gathered from 162 students, from lower-middle socioeconomic homes, during the 1970-1971 school year. The Computer Curriculum Corporation (CCC) reading curriculum for grades three through six was used.

This particular reading curriculum employs a strand structure where each area of the curriculum is taught as a separate content area and is presented in a graduated series of items. The five strands of this reading curriculum included Word Attack, Vocabulary, Literal Comprehension, Interpretive Comprehension and Work Study. Items within a strand were grouped into classes with five items per class. If a student missed none of the items in a class, he/she would then advance to the next class of items. If a student missed more than one item in a class, he/she would repeat the items missed until they were correctly answered. Once a student correctly responded to an item, that item was not repeated.

This findings of this study were that this computer assisted instruction program presented twice as

many new words to students as they received in their regular reading texts.

Another study was conducted by Wilson and Fitzgibbon (1970) using computer assisted instruction to teach english. This pilot study took place in the Waterford Township Schools of Pontiac, Michigan under the Title III Project INDICOM.

Three groups of students selected for the study were from two grade levels: fourth and fifth. The control group I of 42 students received drill and practice in mathematics but not in english. The experimental group of 68 students received computer assisted instruction in both english and math. The control group of 77 students were taught by traditional methods.

Instruction for all three groups consisted of equal amounts of time in english instruction. However the experimental group's fifteen minutes of drill and practice on the computer was included in this amount.

The language subtest of the Stanford Achievement Test battery, Form X, was used as the pretest to all groups and was administrated in February 1969. Form W of the language subtest was used as the posttest in June.

The findings of this study were that both control groups gained three months or one month less than expected.

But the computer assisted instructed group gained seven months or three months more than expected.

Group	Pre SAT	Post SAT	Gain
CAI - EE	4.2	4.9	+.7
Control I	4.7	5.0	+.3
Control II	4.1	4.4	+.3

Also a positive reaction towards computer assisted instruction was elicited from both students and teachers. Students were motivated to complete computer activities in less than the allotted time. Teachers felt that the computer was most useful in the teaching the mechanics of english and more teacher time could be spent on more creative activities.

Studies dealing with computer assisted instruction have not been limited to language arts, other studies have been conducted to see the effect of computer assisted instruction in the teaching of mathematics.

One such study was undertaken by Suppes and Morningstar (1969). They reported results from a drill and practice program in elementary math for students in California for the 1966-67 and 1967-68 school years and for schools in McComb, Mississippi for 1967-68.

The main purpose of this program was to provide drill and practice in arithmetic skills, especially

computation, as an important supplement to the regular classroom instruction.

This program consisted of supplementary drill and practice and gave students not more than ten minutes daily on terminals connected by phone line to the main computer at Stanford University. Starting with only 41 students in the Spring of 1965, student participation was increased in 1967-68 with approximately 1000 students in California and 600 students in Mississippi.

In order to evaluate the effectiveness of this program, the experimental and control groups were administered the math portion of the Stanford Achievement Test, using different forms for pre and posttest.

At the end of the school year, the investigators learned that the administrators of School B, a control school in California had added an additional 25 minutes per day of classroom instruction and practice in math for grades four and five. The improvement in performance of these students in grades four and five were significantly greater in Control School B than in Experimental School A, therefore concluding that an extra 25 minutes a day of classroom drill can be more beneficial than five to eight minutes a day of computer assisted instruction.

The results from postests given to those schools in California concluded that those students who had received computer assisted instruction had significantly greater increase in performance than those students who had not. Also the results from the Mississippi schools indicated the the performance of the experimental students improved significantly more than the control students in grades one through six, especially since many of these students started below grade level in this study.

It can be concluded from this study that drill and practice on the computer takes less time and doesn't require any additionaly effort from the teacher.

Another study conducted using computer assisted instruction to teach mathematics was done by Burns and Bozeman (1981). A sample of forty students, who met pre-established criteria, were used in this study. This sample contained many variables such as grade level, student ability and sex of student.

The primary findings of this study were that a mathematics program that is supplemented with either drill and practice and/or computer assisted instruction was significantly more effective in encouraging student achievement than a program strictly using traditional methods of instruction. Also noted was that computer

assisted instruction programs were significantly more effective in promoting increased student achievement on both elementary and secondary instructional levels.

It was suggested from this study that computer assisted instruction did not significantly enhance the achievement of average students. But supplemental drill and practice on the computer seemed to most effective in stimulating greater achievement gains among intermediate level boys than those receiving only traditional methods of instruction.

Another interesting study was done by Morrison and Adams (1969) who used introductory german students to receive laboratory practice through the use of computer assisted instruction.

This study took place over two years at the State University of New York at Stony Brook and the subjects were students in introductory german. Both experimental and control groups received three hours of instruction per week of regular classtime. The control group received on hour per week of language in addition to classtime. The experimental group received one hour per week of computer assisted instruction in reading and writing.

At midyear, the experimental group of students had remained intact and registered for a second semester of

german, while the control group, who did not work on the computer, had a substantial turnover of students resulting in only four original students rescheduling for a second semester of german.

The Modern Language Aptitute Test (MLAT) was adminstered to both the computer assisted instruction students (experimental) and first and second semester students of the control group. The students grade point average (GPA) in german was also considered.

The results were interesting. The experimental and first semester control students test results were comparable on both the GPA and the Modern Language Aptitude Test. While the second semester control group was slightly superior to the experimental group on the basis of GPA.

The Experimenters also reported that a questionnaire given to the students on the ideal form of german instruction, reported a generally favorable student response towards computer assisted instruction.

Lastly, another study done by Enochs, Handley, and Wollenberg (1986) used computer assisted instruction to teach clerical skills. The purposed of this research was to determine how the performance of two groups of students, being taught through traditional instruction and computer assisted instruction, related to selected variables of

learning style, reading aptitude, comprehension and vocabulary scores.

The population in this study were two randomly assigned groups of 50 U.S. Navy Yeoman "A" School students. Both groups were pretested with the Learning Styles Inventory, the Nelson-Denny Reading Test and the Yeoman "A" School Achievement Test. Their aptitude for learning scores were collected from their service records.

The Yeoman performs various clerical and administrative duties, such as answering telephones, receiving visitors, distributing supplies, and dealing with incoming mail. They also type, organize files and operate mimeograph and copying machines.

These students were taught a series of lessons based on materials common to the job they perform. The experimental group received immediate feedback from the computer and had minimal interactions with the instructors. While the control group used self-paced materials that were competency driven instructional materials that required independent study and interactions with the instructors.

At the end of the study, both groups were posttested using the same Yeoman "A" School Achievement Test.

The collected data showed that the computer assisted instruction group achieved significantly higher than did the students in the self-paced program. Goal setting and achievement in reading comprehension were more related to achievement in the CAI group.

However the control group had a higher positive preference for reading learning styles, as well as preference learning with teachers assistance more than did the CAI group.

Orlansky (1983) reported findings from a Military-Technical training program where computer assisted instruction did not result in lower achievement, nor did it result in notably higher achievement.

Jaminson, Suppes, and Wells (1974) suggested that computer assisted instruction can be effective as a supplement to regular instruction and concluded that computer assisted instruction can be used in some situations to improve achievement scores, particulary for disadvantaged students.

Rude (1986) stated that computer assisted instruction appeared to be most effective when used with low-achieving or high-achieving students rather than with the entire student population.

According to Vinsonhaler and Bass (1972) the use of computer assisted instruction in elementary education along with traditional instruction is usually more effective than traditional instruction alone in developing skills, at least during the first year or two. They also suggested that drill and practice in language arts and math seemed to be strong evidence for the effectiveness of computer assisted instruction over traditional instruction when effectiveness is measured by standardized achievement tests.

Edwards, Norton, Taylor, Weiss and Dusseldorp (1985) stated from research that computer assisted instruction as a supplement to traditional instruction to be more effective than normal instruction alone. When computer assisted instruction was substituted, in whole or part, studies showed that the achievement of computer assisted instructed students were greater.

McEwing and Roth (1985) indicated research findings that suggest as few as ten minutes of computer use per day may result in increased levels of motivation, rates of learning and lengths of retention. Other findings indicate that up to four students working at one computer benefit from this experience as does one student per computer.

Studies in the effectiveness of computer assisted instruction have been conducted in various grades and subject areas with mostly favorable results. Atkinson (1966), Fletcher and Suppes (1971) found positive results in Reading instruction with those elementary school students who used CAI. Wilson and Fitzgibbon (1970) found a seven month gain in those middle school students who were taught English with CAI. Suppes and Morningstar (1969), Burns and Bozeman (1981) found a greater increase in performance with CAI than with traditional methods of instruction. Morrison and Adams (1969) found no significant difference in the results of CAI when teaching German at the college level. Enochs, Handley and Wollenberg (1986) found achievement significantly higher in those U.S. Navy Yeoman who were instructed by CAI in clerical skills.

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APPENDIX A

(LIBRARY SKILLS PRE AND POSTTEST)

PRETEST AND POSTEST

ALPHABETICAL ORDER

Put the following groups of words into alphabetical order.

1. dig _____
   bat _____
   sun _____
   man _____
   log _____

2. time _____
   fame _____
   case _____
   puff _____
   kick _____

3. hope _____
   hike _____
   hall _____
   hold _____
   hulk _____

4. snow _____
   site _____
   save _____
   seed _____
   stop _____

5. sleep _____
   slope _____
   slap _____
   slump _____
   slip _____

6. there _____
   that _____
   this _____
   thump _____
   thorn _____

GUIDE WORDS

First put the list of words in alphabetical order. Then cross out those words that do no belong on this page in the dictionary.

Guide Words -- fable - fall

eye	fair	face	false	fade
faith	flying	fairy	fog	fasten

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

Guide Words -- maid - man

mesh	malt	mammal	might
manner	make	major	maple
	mail	main	

1. _____ 6. _____
2. _____ 7. _____
3. _____ 8. _____
4. _____ 9. _____
5. _____ 10. _____

The dictionary can be divided into three parts; front, middle, and back. Write each word where you would find it.

FRONT (a - i)	MIDDLE (j - r)	BACK (s-z)

collect quilt opposite vitamin

paid using brush trust

vase number effort watchful

mother health genius

USING GUIDE WORDS

Circle the correct set of guide words for each word.

1. dinosaur	a. dignify - diploma	b.danger - dazzle
2. football	a. forge - formal	b. focus - forbid
3. sneeze	a. smoke - soap	b. scale - snail
4. juice	a. judge - junk	b. jump - jury
5. house	a. hedge - honey	b. host - how
6. raccoon	a. radio - rain	b. rabbit - railroad
7. winter	a. wipe - wish	b. wind - wise
8. peanut	a. pea - peak	b. pedal - pelt
9. costume	a. control - corner	b. correct - cotton
10.lizard	a. little - loaf	b. lobster - locket

THE CARD CATALOG

1. A - C	4. J - K	7. R - T
2. D - F	5. L - N	8. U - V
3. G - I	6. O - Q	9. W -Z

Here is a list of authors, titles and subjects. On the following lines, write the number of the drawer where you would find the catalog card.

1. WHALES _____
2. Little House on the Prairie _____
3. Charles M. Schulz _____
4. HALLOWEEN _____
5. Judy Blume _____
6. Curious George _____
7. Sleeping Beauty _____
8. Paul Galdone _____
9. RIDDLES _____
10. PENGUINS _____
11. Jack Kent _____
12. Ugly Duckling _____

CARD CATALOG HUNT

Below is a list of authors, titles and subjects. Write the word you would look for in the Card Catalog and write the letter of the drawer where you would find it in.

	WORD TO LOOK FOR	DRAWER LETTER
1. Books by Dr. Seuss	_____	_____
2. Books about drawing	_____	_____
3. The book, Freckle Juice	_____	_____
4. The book, Animal Riddles	_____	_____
5. Books about gymnastics	_____	_____
6. Books by Beverly Cleary	_____	_____
7. Books by Jules Verne	_____	_____
8. The book, Harry by the sea	_____	_____
9. Books about jokes	_____	_____
10.The book, Bicycle motocross	_____	_____
11. Books by Jane Moncure	_____	_____
12. Books about Thanksgiving	_____	_____

INDEX

LAND TRAVEL

Bicycles 12-13
Buses 34-37
Cable cars 54
Cars 16-21
Coaches 38-39
Cycling 12, 15
Diesel trains 49
Double deckers 34
Early travel 6-13, 20-21, 40-41
Early vehicles 36-37, 41, 44
Freight trains 52
Go-carts 25
Highways 42-43
Horses 9-11
Motorcycles 14-15

Use the Index to answer the following questions.

1. On which pages do we find cars ? _____
2. On which pages do we find horses? _____
3. Is electric train listed in the index? _____
4. How many pages have information about cycling? _____
5. How many pages have information about go-carts? _____
6. How many words are listed for the letter C ? _____
7. The first word listed for the letter D? _____
8. Are highways listed on pages 42-46? _____
9. Are coaches listed on pages 38-39? _____
10. Is motorcycles listed in the index? _____
11. On page 41, would we find information on both early travel and early vehicles? _____

APPENDIX B

(LIBRARY SKILLS WORKSHEETS)

WORKSHEET 1

GUIDE WORDS

Use Y for yes and N for no if the following words belong on this page in the dictionary.

me - mesh

1. matter _____
2. medium _____
3. meat _____
4. mermaid _____
5. mess _____
6. mild _____
7. menu _____
8. melon _____

lady - lava

1. lace _____
2. lake _____
3. lap _____
4. lead _____
5. lash _____
6. law _____
7. knife _____
8. large _____

---

salt - scale

1. saw _____
2. salad _____
3. say _____
4. scene _____
5. sat _____
6. save _____

WORKSHEET 2

USING GUIDE WORDS

Write each set of words in a-b-c order. Then write the guide words on the top lines.

clap	close		_____	_____
club	clean	clock	_____	_____
clam	clear	climb	_____	_____
class	clerk		_____	_____
clutch	clip		_____	_____
			_____	_____
			_____	_____

---

tree	trend	_____	_____
truck	trail		
true	trip	_____	_____
trout	trade	_____	_____
track	troll	_____	_____
trust	trace	_____	_____
		_____	_____
		_____	_____

WORKSHEET 3

THE DICTIONARY

The whole dictionary is divided into three parts-- FRONT, MIDDLE and BACK. Write each word where you would find it.

FRONT (a - i) MIDDLE (j - r) BACK (s - z)

---

plum	tiger	happy	love
igloo	zebra	flowers	color
sun	apple	juice	monkey
until	drive	skating	

WORKSHEET 4

THE CARD CATALOG

SCHOOL SEVEN CARD CATALOG

A	G - H	S - T
B	I - L	U - Z
C - D	M - O	
E - F	P -R	

The following lists of Authors, Titles, and Subjects are listed in the Card Catalog. Put the letters of the drawer you would look in to find them.

AUTHORS	TITLES	SUBJECTS
Bright, Robert ___	Georgie ___	TIGERS ___
Nolan, Dennis ___	The Biggest Bear ___	GHOSTS ___
Seuss, Dr. ___	If I ran the circus ___	HALLOWEEN ___
Lynd Ward ___	Hop on Pop ___	MONSTERS ___
Charlotte Zolotow ___	The Mean Old man ___	SCHOOL STORIES ___
Blume, Judy ___	Cinderella ___	ANIMALS ___

WORKSHEET 5

CARD CATALOG HUNT

Here is a list of authors, titles, and subjects. Write Y for yes is the answer is correct and N for no is the answer is incorrect.

		WORD TO LOOK FOR	DRAWER LETTER
_____	1. Books by Robyn Supraner	Robyn	R
_____	2. The book, Wacky Wednesday	Wacky	W
_____	3. The book, Are you my mother?	Are	A
_____	4. Books about jokes	jokes	J
_____	5. Books by Frank Modell	Frank	F
_____	6. The book, The Wizard of Oz	The	T
_____	7. Books about Spring	fall	F
_____	8. Books by Ian Thorne	Thorne	T
_____	9. The book, The Blue Fairy Book	Blue	B
_____	10. Books about monsters	monsters	M
_____	11. The book, Hop on Pop	Pop	P
_____	12. Books about baseball	baseball	B

WORKSHEET 6

USING AN INDEX

Index

Apes 13
Baboons 12
Bears 22-24
Circus 2
Cougars 32
Deer 33
Elephant handlers 43
Elephants 42-45
Endangered species 54
Frank (elephant) 43
Gorilla 11, 12
Happy (elephant) 44
Highway Zoo 3
Jumbo 43
Kentucky Zoo 3
Little Dumbo 43
Long journey 47
Monkey 15
Morris (monkey) 15
Park, John 51
Prince (gorilla) 11
Ringling Bros. (circus) 2

Use the index to answer the following questions.

1. On what page do we find monkey? _____
2. On what page do we find Ringling Bros.? _____
3. What is Mr. Park's first name? _____
4. Is circus listed in this index? _____
5. Is there an elephant named Frank? _____
6. Are gorillas found on pages 11 and 15? _____
7. Was Happy an tiger? _____
8. Is there a City Zoo? _____
9. On what page is Little Dumbo found? _____
10. Apes are found on page _____.
11. How many items are listed for the letter E? _____
12. Are cougars listed on pages 56-58? _____

WORKSHEET 7

USING AN INDEX

(SPORTS AND ENTERTAINMENT)

Actors 38-39, 41
Athletics 32-35
Ballet 58
Baseball 11
Basketball 8
Boxing 20-21
Cartoons 36
Circus 42
Clowns 42
Cycling 16-17
Dancing 56-57, 58
Diving 18-19
Field Hockey 9
Football 12-13
Gymnastics 30-31

Answer the following questions using the Index.

1. On which pages do we find cycling? _____

2. On which pages do we find football? _____

3. Is canoeing listed in this index? _____

4. How many pages have information about actors? _____

5. How many pages have information about clowns? _____

6. How many words are listed for the letter B? _____

7. The first word listed for the letter C is _____.

8. Is soccer listed in the index? _____

9. Is diving listed on pages 18-19? _____

10. Is baseball listed on pages 20-21? _____

11. On page 42, would you find information on both the circus and clowns? _____

APPENDIX C

(RAW SCORE RESULTS ON PRETEST AND POSTTEST)

RAW SCORE RESULTS ON PRETEST AND POSTTEST

	CONTROL		EXPERIMENTAL	
PRETEST	93		113	
	109		78	
	102		100	
	105		97	
	86		106	
	75	M=96.5	94	M=100.5
	99	SD=12.42	97	SD=13.01
	74		99	
	99		110	
	113		102	
	99		127	
	104		83	
POSTTEST	92		109	
	109		120	
	104		102	
	99		100	
	100		120	
	101	M=104.91	98	M=109.25
	117	SD=9.35	115	SD=9.50
	92		109	
	102		114	
	106		101	
	116		125	
	121		98	